

PATENT COOPERATION TREATY

From the
INTERNATIONAL SEARCHING AUTHORITY

PCT

Translation

WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING AUTHORITY

(PCT Rule 43bis.1)

To:

Date of mailing
(day/month/year)

Applicant's or agent's file reference

2727PLD662FD

FOR FURTHER ACTION

See paragraph 2 below

International application No.

PCT/FR2004/001876

International filing date (day/month/year)

16.07.2004

Priority date (day/month/year)

18.07.2003

International Patent Classification (IPC) or both national classification and IPC

Applicant

SNECMA PROPULSION SOLIDE

1. This opinion contains indications relating to the following items:

- ☒ Box No. I Basis of the opinion
- ☐ Box No. II Priority
- ☐ Box No. III Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
- ☐ Box No. IV Lack of unity of invention
- ☒ Box No. V Reasoned statement under Rule 43bis.1(a)(i) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
- ☐ Box No. VI Certain documents cited
- ☐ Box No. VII Certain defects in the international application
- ☐ Box No. VIII Certain observations on the international application

2. FURTHER ACTION

If a demand for international preliminary examination is made, this opinion will be considered to be a written opinion of the International Preliminary Examining Authority ("IPEA") except that this does not apply where the applicant chooses an Authority other than this one to be the IPEA and the chosen IPEA has notified the International Bureau under Rule 66.1bis(b) that written opinions of this International Searching Authority will not be so considered.

If this opinion is, as provided above, considered to be a written opinion of the IPEA, the applicant is invited to submit to the IPEA a written reply together, where appropriate, with amendments, before the expiration of 3 months from the date of mailing of Form PCT/ISA/220 or before the expiration of 22 months from the priority date, whichever expires later.

For further options, see Form PCT/ISA/220.

3. For further details, see notes to Form PCT/ISA/220.

Name and mailing address of the ISA/EP

Authorized officer

Facsimile No.

Telephone No.

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Box No. I

Basis of this opinion

1. With regard to the language, this opinion has been established on the basis of the international application in the language in which it was filed, unless otherwise indicated under this item.
☐ This opinion has been established on the basis of a translation from the original language into the following language
_____, which is the language of a translation furnished for the purposes of international search (under Rule 12.3 and 23.1(b)).
2. With regard to any nucleotide and/or amino acid sequence disclosed in the international application and necessary to the claimed invention, this opinion has been established on the basis of:
 - a. type of material
☐ a sequence listing
☐ table(s) related to the sequence listing
 - b. format of material
☐ in written format
☐ in computer readable form
 - c. time of filing/furnishing
☐ contained in the international application as filed.
☐ filed together with the international application in computer readable form.
☐ furnished subsequently to this Authority for the purposes of search.
3. ☐ In addition, in the case that more than one version or copy of a sequence listing and/or table(s) relating thereto has been filed or furnished, the required statements that the information in the subsequent or additional copies is identical to that in the application as filed or does not go beyond the application as filed, as appropriate, were furnished.
4. Additional comments:

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Box No. V Reasoned statement under Rule 43bis1(a)(i) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty (N)	Claims	3, 11-20	YES
	Claims	1, 2, 4-10	NO
Inventive step (IS)	Claims		YES
	Claims	1-20	NO
Industrial applicability (IA)	Claims	1-20	YES
	Claims		NO

2. Citations and explanations:

Reference is made to the following document:

D1: EP-A-0 735 387 (AEROSPATIALE) 2 October 1996 (1996-10-02)

1. Novelty (PCT Article 33(2))

a. Document D1 describes a lightweight structure made of SiC of the sandwich type with a honeycomb core, for the production of lightweight mirrors (column 1, lines 1-7). From the honeycomb structure it may be assumed that the pore volume fraction is greater than 80%. The porous core is a refractory material consisting of a carbon fibre reinforcement consolidated by a matrix, which is a mixture of SiC and C. The core is covered on both sides with a sheet of the felt type containing carbon fibres. This sheet is housed partly in the cells. This felt is stiffened and bonded to the shells of the honeycomb cells by chemical vapour deposition of SiC. This felt is also plugged up with a solid refractory filler of SiC, which reduces the surface porosity of the sheet. Finally, the surface of the sheet is densified by chemical vapour deposition of SiC, forming two external ceramic skins (column 3, lines 7-55).

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It may be certain that the structure of the sandwich type of document D1 has a composition gradient in the thickness direction of the structure, because the porous core and the sheet do not contain only SiC but also carbon, whereas the external skins contain only SiC, and there is at least an SiC concentration gradient going from the intermediate layer of the sheet towards the SiC-only external skins.

From the presence of the honeycomb core it may be assumed that the bulk density is less than 1.

The core of the sandwich comprises a plurality of cells, the walls of which are reinforced by chemical vapour deposition of SiC (column 3, lines 21-23). The walls of the honeycomb therefore form stiffeners, which of course have a smaller thickness than 1 mm, and have cavitated portions, that is to say the cells of the honeycomb.

The content of document D1 throws into question the innovativeness of claims 1, 2 and 4-10.

2. Inventive step (PCT Article 33(3))

a. The fibres of the porous core of document D1 are not of the rayon-derived type, but the fibres of the intermediate layer that cover this porous core are indeed of the rayon-derived type (see column 4, line 50 to column 5, line 4). A person skilled in the art does not need to perform an inventive step to replace the fibres of the core with the fibres of the intermediate layer. Moreover, the applicant has not indicated surprising or

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inventive effects due to the use of this specific type of fibre.

The subject matter of claim 4 therefore does not involve an inventive step (PCT Article 33(3)).

b. The closest prior art to claims 11-20 is document D1.

The difference between claims 11-20 of the application and document D1 is that the solid filler that is infiltrated into the porous core is mixed with a liquid containing a ceramic precursor polymer before the infiltration.

The advantage of specifically adding the polymer is not clearly apparent from the application. Should there be no specific effect, the applicant must provide arguments showing that this effect is surprising, in order to give a basis for an inventive step.

The subject matter of the present claims 11-20 therefore does not involve an inventive step (PCT Article 33(3)).